

# **YWD INFORMATION ON TAP**

## **PFAS FAQ: Putting All the Pieces Together**

### What Does PFAS Stand For? How Many Are There? And In What Products Are They Found?

According to the CDC<sup>1</sup>, **Per-and Polyfluoroalkyl substances (PFAS)** are a very large and diverse group consisting of thousands of chemicals, used in an extensive variety of product coatings because they resist breakdown and are highly stable in the presence of heat, oils, stains, grease, and water. Due to this, they were and continue to be extensively found in stain resistant clothing, furniture, adhesives, food packaging (microwave popcorn, pizza boxes, sandwich wrappings), heat-resistant non-stick cookware, fire-fighting foam, biosolids, and even personal care products. For the majority of these chemicals, human health effects are still unknown. Increasingly, scientific study evidence exists on specific chemicals ability to cause disease/cancer.

### Why are some PFAS a Problem?

The same characteristics that make PFAS widely beneficial in consumer, commercial, and industrial products, also make them pervasive in, and very hard to remove from our environment. Many of these chemicals can easily move through soils, be dissolved in groundwater and drinking water, and bioaccumulate or build up in most living things.<sup>2</sup> In general, newer PFAS alternatives are shorter-chain species, so these are thought to be less likely to cause health effects as they can be more quickly eliminated from the human body.

### Is There PFAS Exposure in People?

According to the EPA<sup>2</sup>, many PFAS are found in the blood of people and animals all over the globe and are still present at low levels in a variety of food products and the environment. People gain exposure by consuming PFAS contaminated water or food, other products containing them or coming in contact with these chemicals which were used widely in product manufacturing.

### What Are the Most Prevalent PFAS?

According to CDC<sup>1</sup>, numerous PFAS have been used in manufacturing since the 1940s. It was only in the early 2000s, with the discovery of several PFAS in human blood and the concern of potential harmful effects, led to the majority

(but not all) uses of the two most widely used and studied chemicals in the PFAS group: **(PFOA)-Perfluorooctanoic Acid** and **(PFOS)-Perfluorooctane Sulfonate** to be phased out by US manufacturers. In recent years, PFOA and PFOS have been replaced with shorter chain alternatives developed to retain the desired characteristics but also be more quickly eliminated from the human body.<sup>1</sup> In general, the newer species are thought to be less likely to cause health effects. The majority of alternatives produced are called GenX chemicals. These include the two major chemicals of **HFPO-DA-Hexafluoropropylene oxide dimer acid** and its ammonium salt, which is extracted and measured as the dimer acid species and **(PFBS)-Perfluorobutanesulfonic acid**.

The four species with EPA health advisories include:

- **(PFOA)** Perfluorooctanoic Acid ,
- **(PFOS)** Perfluorooctane Sulfonate,
- **(HFPO-DA)** Hexafluoropropylene oxide dimer acid and its ammonium salt, measured as one, and
- **(PFBS)** Perfluorobutanesulfonic acid.

### **What evidence is there that PFAS is a Concern?**

The EPA is very concerned about the public health implications based on their findings for some PFAS chemicals. For that reason, it has issued updated interim health advisories for PFOA and PFOS and health advisories for GenX and PFBS. ***Drinking water health advisory levels are used to protect people over a lifetime of exposure and are even lowered below the calculated concentration of concern, to offer a higher margin of safety against adverse health effects.***

The EPA updated health advisories for PFOA and PFOS are based on scientific information collected from populations with known exposure to these chemicals. These human studies have found associations<sup>2</sup> with these compounds and disease and cancer. There is “suggestive<sup>2</sup> evidence” of likely carcinogenic potential in humans. The EPA has not derived a firm Cancer risk concentration in water, so cancer analyses is ongoing for both PFOA and PFOS. The EPA is very concerned about the newest findings, and the much lower calculated impacting levels. These new levels are much lower than first thought and set under the original health advisory. EPA has issued new interim updated health advisories for PFOA (0.004 ppt) and PFOS (0.02 ppt). For PFOA, this new advisory level is more than 17,000 times lower than the original health guidance and PFOS, is

more than 3,500 times lower. 70 parts per trillion (ppt) for individual and combined was issued in the first advisory.

For GenX chemicals (HFPO-DA) and PFBS, health advisories are currently based on animal toxicity studies, not human studies. For these chemicals, there is also “suggestive<sup>2</sup> evidence” of links to disease/cancer in animals. Data is also insufficient to derive a cancer risk concentration in water for GenX chemicals at this time and there are no known studies looking at PFBS for cancer effects so the potential for cancer effects could not be evaluated in this case. There was no previous health guidance for these chemicals. The final health advisories for GenX chemicals and PFBS are 10 ppt and 2,000 ppt, respectively.<sup>2</sup>

**NOTE:** Health advisories identify ideal-case levels, at which adverse health effects are not anticipated to occur over a lifetime of exposure. It may not be possible to reach these levels at times, but none-the-less, this is the goal for chemical advisories where there is no health standard set. These health advisories are also typically based on on-going information, so can change as new information becomes available.

### **Some Health Advisory Levels are Unattainable:**

One of the major troubles with some health advisory levels is the fact that there is no consideration as to whether they can be achieved. In this case, 2 of the 4 PFAS health advisory levels (PFAS & PFOA), are unattainable at this time, 100 to 500 times below, what can currently be detected by any approved testing method. This leaves compliance with the advisories unsettling, unknown, and problematic, until such time methods can be developed to achieve the desired very low-level detection. EPA and the scientific community will undoubtedly be searching for or developing test methods which can detect as low as is needed. In the meantime, they must decide on a target level that is feasible and reasonable to achieve, using the best available technology.

### **What PFAS Chemicals are Currently Being Regulated by the State of Maine?**

There are currently no enforceable EPA/federal standards for PFAS in drinking water but there are recently established and enforceable State of Maine standards for six PFAS species. The State of Maine has the legal right to set State enforceable drinking water standards ahead of EPA, and has, proactively established legislation to require Maine public water suppliers to test for six PFAS and report results for treated water to the State by the end of 2022.<sup>5</sup> Maine has established an interim enforceable State Standard for drinking water at 20 parts

per trillion (ppt) for six PFAS, alone or in combination. The State list currently does not include 2 PFAS in the health advisory but does include 4 additional PFAS species which may prove to be a concern. Depending on what regulation and what PFAS species are brought forward by EPA for required testing, public water suppliers will need to be sure they are testing for the required species.

The six State regulated PFAS are as follows:

- **PFOA**, Perfluorooctanoic Acid
- **PFOS**, Perfluorooctane Sulfonate
- **PFHxS** - Perfluorohexane Sulfonic Acid,
- **PFNA** - Perfluorononanoic Acid,
- **PFHpA** - Perfluoroheptanoic Acid, and
- **PFDA** - Perfluorodecanoic Acid.

### **What Testing Has been Performed at York Water District?**

In 2003, YWD performed several rounds of quarterly PFAS sampling for 6 PFAS species as required by the EPA under the Unregulated Contaminant Monitoring Rule (UCMR). Five of the six PFAS were those that are now required by the State of Maine. The lower limit of detection for all PFAS in 2003 was 20 parts per trillion (ppt), ten times higher than today's achieved 2 ppt. All four YWD quarters of 6 PFAS were undetectable at 20 ppt.

To be proactive, from 2020 into 2021 and continuing, YWD restarted quarterly sampling of YWD treated water and interconnection water transferred. All results were undetectable at 2 ppt (10 times lower detection than in 2003). In advance of coming State regulation in 2022, YWD changed laboratories to one that obtained new, Maine State certification, for PFAS analysis and is now monitoring for 18 different PFAS including those required by the State of Maine and all those listed in the recent Health Advisory. All sample results have been undetectable for all 18 PFAS monitored in our treated water. The best/lowest detection limit the laboratory can achieve (2 ppt) is still expectedly inadequate to detect low enough for PFOS and PFOA to assess the levels based on the health advisory and are expected to be inadequate for years to come.

Our licensed Operators have also taken samples directly from Chase's Pond at the dam, which were all undetectable at 2 ppt and samples from three streams that supply the pond. There was only one low hit of PFOA in one stream, Moose Brook (2.3 ppt), which is the single stream that comes from a developed residential area, so this is not a surprise. This very low level is lowered/diluted extensively by the addition of other water sources until it is not detected at our

pond intake. As pervasive in our environment that PFAS is said to be, the lower we can detect it, the more likely we might see minute levels almost everywhere.

### How does this Translate into Enforceable Drinking Water Standards for water supplied to YWD customers?

The State of Maine interim enforceable drinking water standards continue to apply to YWD which are any of the six PFAS species at 20 ppt alone or in combination. District treated water continues to easily meet these standards, but it is impossible to know with regards to the health advisory standards for PFOS and PFOA into the future.

The established health advisory levels are non-enforceable and only serve as the initial technical information from which, in part, drinking water enforceable regulations will be created. The health advisories would be considered the ideal "Goal" as it is the level at which there is no impact to human health. New federal health standards are expected before the end of 2022. Drinking water Maximum Contaminant Level Goals (MCLG) for around 6 PFAS will likely be established at or near the health advisory levels. Just like health advisory levels, drinking water MCLG are also non-enforceable public health goals that only consider public health and not the limits of testing detection or whether treatment to the desired level is even possible or cost-effective. **Drinking water MCLG's are sometimes set at levels which public water suppliers cannot achieve due to technological limitations and/or prohibitive costs.**

Federal Maximum Contaminant Levels (MCL) are the legally enforceable highest level of contaminant allowed in drinking water. **The EPA sets these MCL "as close to MCLGs as is feasible using the best available technology and taking cost into consideration"**-EPA. When the MCLs are finalized, public water suppliers have three years to ensure they are met. This could involve adding treatment technology for some. These MCL are anticipated to be at or near the current limits of detection for PFAS around 2 ppt. YWD is likely to be in good shape to continue to comply with a 2 ppt MCL for any PFAS species.

### What Can be Said to Address Customer Concerns?

There is a lot of water industry concern over the confusion this regulation will cause customers, since water suppliers cannot technically say there is no risk or even test down to the health advisory levels to allow certainty. A group of regional Water Utility Associations including Maine Water Utilities Association, has submitted a letter to the EPA Regional Administrator to "express our confusion,

concern, frustration, and need for more direct support regarding the Environmental Protection Agency's release of updated Health Advisories and the untenable position of having no way to answer or counter customer concerns about the levels that may be in their drinking water."<sup>6</sup>

### **Summary Points:**

1. Preliminary but increasing information suggests at least some PFAS are disease causing and potentially carcinogenic to humans. The EPA, YWD, and the public should be concerned about the potential impact of these chemicals on the human body and our environment. Health agencies are working to better understand more about the health effects of low level, long-term exposure to these chemicals and what will be needed to lower risk.
2. The science of PFAS is in its early stages but is rapidly being studied for a better understanding. The different PFAS chemicals present, their occurrence, and levels of concern continue to evolve.
3. There are currently no federally regulated drinking water standards for any PFAS, but there are 6 PFAS species regulated by the State of Maine, of the thousands possible. The State of Maine interim enforceable drinking water standards continue to apply to YWD which are any of the six, state specified PFAS species at 20 parts per trillion, alone or in combination.
4. The EPA continues to work on determining at what level or levels and for what PFAS species, to set federal enforceable drinking water standards known as Maximum Contaminant Levels (MCL) and Maximum Contaminant Level Goals (MCLG). The EPA will continue to evaluate more information as it becomes available and how to best protect human health and the environment.<sup>2</sup>
5. The current limits of testing methods for many PFAS do not allow for the evaluation of any drinking water with certainty. Current testing methods cannot measure low enough to allow evaluation. In many cases, new EPA approved testing methods must be developed that can test down to hundreds of times lower levels to be able to assess PFAS risk.
6. The EPA Health Advisories released are not regulations or enforceable standards but are goals in an ideal world. The data collected for these advisories also serves as technical information to be considered when setting federal drinking water enforceable Maximum Contaminant Levels Goals (MCLG) and Maximum Contaminant Levels (MCL) for PFAS species. It is extremely difficult to explain what health advisory levels mean and why allowed levels in drinking water are likely to be higher than health advisory levels.

7. Treatment options must be found, studied, and brought forward for PFAS reduction in drinking water that are effective at reducing minute levels potentially down to parts per quadrillion.
8. Water supplied to York Water District's customers continues to easily meet current PFAS State standards for drinking water. The district is fortunate to own or control 90% of its 1877-acre watershed, thereby allowing little opportunity for PFAS contamination, however, as detection limits are improved and fall to minute levels in parts per quadrillion, it is impossible to truly predict whether the district will see any minute detects of PFAS. The district will remain vigilant and proactive in monitoring PFAS and PFAS levels as well as upcoming new PFAS detection methods and regulation. Notification and treatment or other remedies must take place if state interim standards or new federal standards are exceeded.

### **References and Locations of Additional Information:**

1. Per- and Polyfluorinated Substances (PFAS) Factsheet | National Biomonitoring Program | CDC [https://www.cdc.gov/biomonitoring/PFAS\\_FactSheet.html](https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html)
2. Per- and Polyfluoroalkyl Substances (PFAS)- US EPA:  
<https://www.epa.gov/pfas>
  - o PFAS Explained- US EPA: <https://www.epa.gov/pfas/pfas-explained>.
3. Lifetime Drinking Water Health Advisories for Four Perfluoroalkyl Substances, EPA Document Number: 2022-13158.  
<https://www.federalregister.gov/documents/2022/06/21/2022-13158/lifetime-drinking-water-health-advisories-for-four-perfluoroalkyl-substances>
4. Drinking Water Health Advisories for PFAS: Fact Sheet for Communities, <https://www.epa.gov/system/files/documents/2022-06/drinking-water-ha-pfas-factsheet-communities.pdf>.
5. PFAS Testing in Public Water Systems in Maine, <https://www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws/pfas.shtml>
6. MWUA letter to regional EPA administrator: Health Advisories for Per-and Polyfluoroalkyl Substances (PFAS), July 6, 2022.